

# Manufacturing Facility Roof Reinforcement

Lindapter Girder Clamps provided a solution for reinforcing the roof of a manufacturing facility prior to installing solar panels.

## Project Background

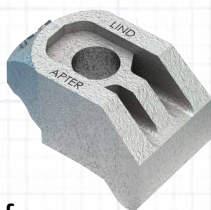
**Location:** Trenton, New Jersey, USA

**Product:** Type AF Girder Clamps

**Client:** Trane Inc.

**Installer:** GE Solar

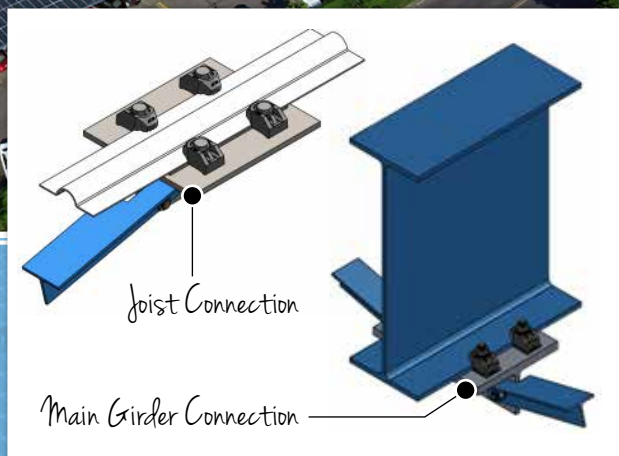
**Specifier:** Greenman-Pedersen Inc.



Trane Inc. is a global manufacturer of heating, ventilation and air conditioning (HVAC) systems with 104 manufacturing locations in 28 countries. The company has an ambitious Global Climate Commitment which includes a 35-percent reduction of greenhouse gas emissions from its operations. As part of this commitment Trane wanted to install a solar power system on the roof of its factory in Trenton.

## Client Requirement

To determine if the existing steel roof was capable of taking the extra loads that would be imposed by installing 5,500 photovoltaic panels, engineers needed to cut out a section of the existing roof joist for testing. The test results concluded that reinforcing from the lower joists to the main support beam was required at about 40 load critical locations, and that a safe and secure method of connecting bracing would be required.



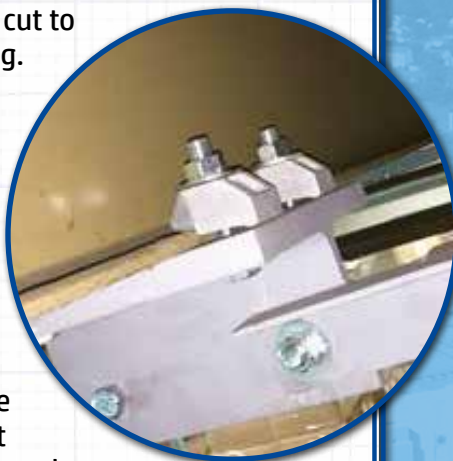
Type AF Girder Clamps connect the bracing support

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## Design Solution

Lindapter provided a custom splice support connection, consisting of a location plate and 8 x Type AF girder clamps, to reinforce the joist where it had been cut to remove a section for testing.

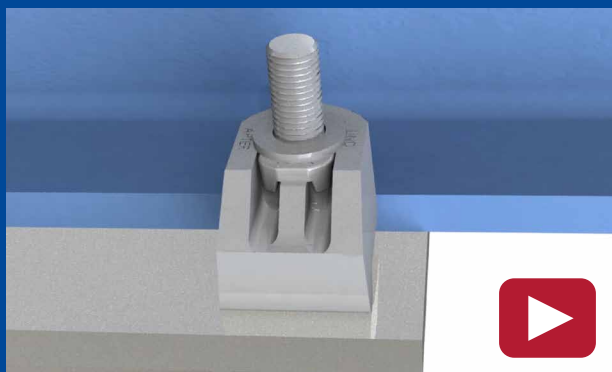
To strengthen the roof between the lower joists and main support beam a girder bracing assembly was designed to increase lateral stability. This involved a reinforcement assembly being connected to the main beam using Type AF high slip resistance girder clamps in a four-bolt configuration and new WT steel sections connected to provide bracing.



## Installation

Each bracing assembly was carefully lifted into position and then secured to the bottom flange of the existing steel joist using size 1/2" Type AF girder clamps. The adjustability of the girder clamps allowed the contractor to slide and align the bracing assemblies into the exact positions required, before they were tightened with hand tools. The new WT steel bracing sections were then connected to the bracing assembly and attached to the outer support beams.

Click to watch the **Type AF** installation video



## Result

Lindapter girder clamps provided a drilling and weld free connection that reduced disruption, shutdown time for the factory and labor costs.

Reinforcing was accomplished in record time without contaminating the manufacturing floor and the high capacities of the Type AF provided the necessary tensile, slip and combined loads.

The girder clamps have independent technical accreditations, including the CE mark (ETA-13/0300), TÜV, Lloyd's Register approvals and ICC-ES approval. These accreditations verify the load and slip capacities that led to successful reinforcement of the roof.

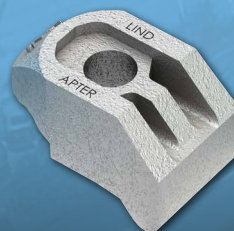
The factory now generates around 15% of its own power through the solar power system and over the next 20 years will save an estimated 35,000 tons of greenhouse gas emissions.

## Approvals



## Key Benefits

- ✓ High slip resistance for tensile and frictional loads
- ✓ No drilling or welding required
- ✓ Fully adjustable for easy installation in the field



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details